REMARKS

Claims 1-42 are pending in this application.

Claims 1, 2, 8, 10, 12, 18, 19, 20, 22, 23 and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Sakoda et al. (U.S. Patent No. 6,888,789, hereafter "Sakoda"). Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakoda as applied to claim 1. Finally, claims 3-7, 11, 13-17, 21 and 25-42 are objected to as being dependent upon a rejected claim base, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Objections to the Specification

The Examiner objects to the **specification** because of various informalities.

Page 16, lines 20-21

The Examiner objects regarding finding the labels mentioned on page 16, lines 20-21, in FIG. 5. We have amended formal drawing FIG. 5 so that the labeling matches that originally submitted.

Page 18, lines 16-19

The Examiner objects regarding finding the labels mentioned on page 18, lines 16-19, in FIG. 7. The labels were omitted from the formal drawings. On the revised FIG. 7, we have followed the Examiner's suggestion for labels.

Page 18, line 24

The Examiner points out a typographical error on **page 18, line 24**, which is corrected by amendment.

Replacement drawings are submitted with this response.

Rejection Under 35 U.S.C. § 102(e) of Claims 1, 2, 8, 10, 12, 18, 19, 20, 22, 23 and 24

The Examiner rejects **claims 1, 2, 8, 10, 12, 18, 19, 20, 22, 23 and 24** under 35 U.S.C. § 102(e) as anticipated by Sakoda et al. (US Patent 6,888,789).

Claim 1

Claim 1 includes the limitations:

A method of selecting a bit load b per sub channel in a multicarrier system, the multicarrier system encoding data based on a constellation of points, each point representing a tuple of data, the constellation having a self similarity property, comprising:

selecting the bit load per sub channel based on the self similarity property of the constellation.

These limitations are not found in Sakoda et al.

We can readily identify three thrusts to the continuously adaptive method taught by Sakoda et *al*. First, differential modulation for small packets. (*E.g.*, col. 10, lines 54 et seq.) Second, differential encoding, also for small packets. (Col. 11, lines 3 et seq.) Third, inserting pilot symbols for larger packets. (Col. 13, lines 56 et seq.) The point of these dynamically selected and constantly changing variations from standard OFDM methods is to "constantly use the optimum transmission method when transmitting packets having different sizes and thereby improve the transmission efficiency and enhance the quality of communication." (Col. 15, lines 51-54) Sakoda et al. emphatically teach changing transmission parameters, even packet by packet. What Sakoda et al do not teach is anything about bit loading subchannels.

We reproduce below the 22 lines of Sakoda on which the Examiner relies as a basis for anticipation:

First, an explanation will be made of the data modulation method used in the communication system of the present embodiment by referring to FIG. 8 and FIG. 9. Here, the explanation will be made with reference to the two QPSK and 16QAM data modulation methods frequently used in multi-carrier communication.

FIG. 8 is a view of the signal distribution showing the QPSK modulation method. Note that this signal distribution diagram is also referred to as a constellation. In QPSK modulation, the modulation is performed by two bits of data in one sub-carrier. For this reason, as shown in FIG. 8, a modulated signal has four distributions. These correspond to (0, 0), (0, 1), (1, 0), and (1, 1) of the modulated data. In a modulated signal obtained by the QPSK modulation, the interval between distribution points of the signals is large, that is, the Hamming distance of the modulated signal is large, therefore the error rate due to the noise of the transmission path is low and the noise tolerance is good. In this modulation method, however, the rate of utilization of the frequency band is low, therefore this method is usually applied to an environment where the size of the data is relatively small and the influence of the noise in the transmission path is strong.

This passage describes the structure of QPSK modulation, without identifying it as self similar or recursive. The distributions in four quadrants of figure 8 are identified as "four distributions", without any similarity or self similarity being identified. Moreover, the passage has nothing to do with "*selecting the bit load per sub channel based on the self similarity property of the constellation*". We cannot find any passage in Sakoda et al. that discusses bit loading of sub channels, much less any connection between the cited passage and bit loading of sub channels.

Therefore, claim 1 should be allowable over Sakoda et al.

Claim 2

Claim 2 includes the limitations:

determining a probability of having k bit errors in an erroneous tuple (p(k,b)) based on the self similarity property of the constellation

These limitations are not found in Sakoda et al. In the cited passage, reproduced above, there is no mention of probability calculations or self similarity.

Therefore, claim 2 should be allowable over Sakoda et al.

Claim 8

Claim 8 should be allowable over Sakoda et al. for at least the same reasons as claim 1, from which it depends.

Claim 10

Claim 10 includes the limitations:

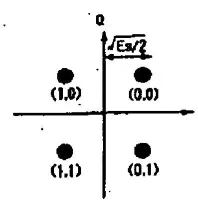
wherein the sub channel has a bit error rate, and further comprising:

determining a mean square deviation of the number of bit errors in an erroneous tuple;

wherein said selecting further comprises selecting the bit load per sub channel based on said mean square deviation of the number of bit errors in an erroneous tuple

These limitations are not found in Sakoda et al.

FIG.8



The Examiner relies on figures 8 and 9 and passages at col. 10, lines 9-22 and col. 20, lines 44-48. Neither the figure nor the passages read on the limitations. We see nothing in figure 7 that remotely relates to a mean square deviation. The use of a square root symbol in figure 8 appears to relate to Hamming distances, not mean square deviations. Sakoda et al. explain, "FIG. 8 is a view of the signal distribution showing the QPSK modulation method." This has nothing to do with the number of bit errors in an erroneous tuple. The passages from cols. 10 and 20 are also off point. Both passages describe extraction of bits, rather than selecting bit loading per sub channel.

Therefore, claim 10 should be allowable over Sakoda et al.

Claim 12

Claim 12 should be allowable over Sakoda et al. for at least the same reasons as claims 10 and 1 from which it depends.

Claim 18

Claim 18 should be allowable over Sakoda et al. for at least the same reasons as claim 1, from which it depends.

Claims 19, 20 and 22-24

Claims 19, 20 and 22-24 include the limitations:

19. A method of selecting a bit load b for a channel in a communications system, the communications system encoding data based on a constellation of points, the constellation having a self similarity property, comprising:

selecting the bit load for the channel based on the self similarity property of the constellation.

20. The method of claim 19 wherein the channel has a bit error rate, and further comprising:

determining a mean square deviation of the number of bit errors in an erroneous tuple;

wherein said selecting further comprises selecting the bit load based on said mean square deviation of the number of bit errors in an erroneous tuple.

22. The method of claim 19 wherein said self similarity property is a Hamming distance of the points of the constellation.

23. An apparatus for selecting a bit load b for a channel in a communications system, the communications system encoding data based on a constellation of points, the constellation having a self similarity property, comprising:

means for selecting the bit load for the channel based on the self similarity property of the constellation.

24. The apparatus of claim 23 wherein the channel has a bit error rate, and said means for selecting further comprises means for determining a mean square deviation of the number of bit errors in an erroneous tuple, wherein said means for selecting selects the bit load based on said mean square deviation of the number of bit errors in an erroneous tuple.

These limitations are not found in Sakoda et al. Without addressing any of these claims individually, the Examiner refers to the rejections of claims 1, 10 and 18, to which we persuasively responded above. Therefore, these claims should be allowable.

Applicants respectfully submit that claims 1, 2, 8, 10, 12, 18, 19, 20, 22, 23 and 24 should be allowable over Sakoda et al.

Rejection Under 35 U.S.C. § 103(a) of Claim 9

The Examiner rejects **claim 9** under 35 U.S.C. § 103(a) as unpatentable over Sakoda et al. (US Patent 6,888,789). **Claim 9** includes the limitation:

wherein said constellation is non square

This limitation is not found in Sakoda et al. The Examiner argues, "it is well known in the art that the shape of the constellation does not affect the self-similarity property." This does not address the applicability of the disclosed method (*see* Applic. pp. 28-34) to non square constellations. Nor does it relate to Sakoda. Again, Sakoda does not discuss bit loading or apply self similarity to bit loading. One cannot bootstrap from a diagram of a QPSK constellation to a notion of self similarity to bit loading based on self similarity to an application that involves a constellation shape which Sakoda does not even hint about.

Applicants respectfully submit that claims 9 should be allowable over Sakoda et al.

Allowable Subject Matter

Claims 3-7, 11, 13-17, 21 and 25-42 are objected to as being dependent upon a rejected claim base, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicant appreciates the Examiner's indication of allowable subject matter.

Interview Request

Counsel requests an interview to discuss the pending issues and to consider any amendments that the Examiner might propose to put the case in condition for allowance. Other highly mathematical expositions by inventor Mitlin have benefited from examiners' suggestions.

CONCLUSION

Applicants respectfully submit that the pending claims are now in condition for allowance and thereby solicit acceptance of the claims, in light of these amendments.

The undersigned can ordinarily be reached at his office at (650) 712-0340 from 8:30 a.m. to 5:30 p.m. PST, Monday through Friday, and can be reached at his cell phone at (415) 902-6112 most other times.

Respectfully submitted,

Dated: 28 November 2005

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Annotated Sheet Showing Changes

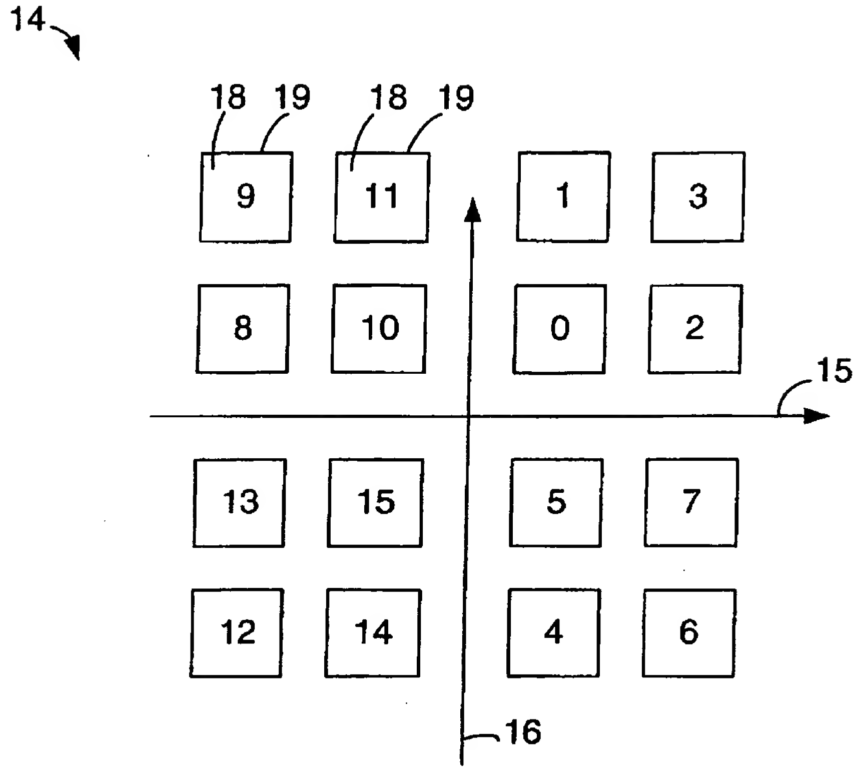

FIG. 1

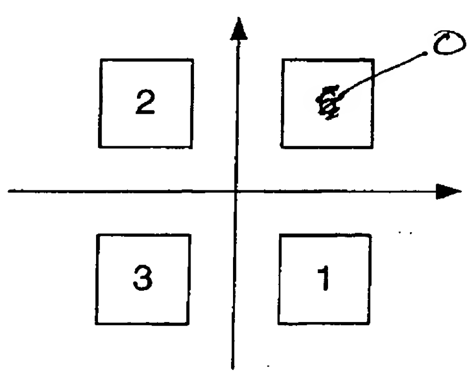

FIG. 5

Marked to Show Revisions

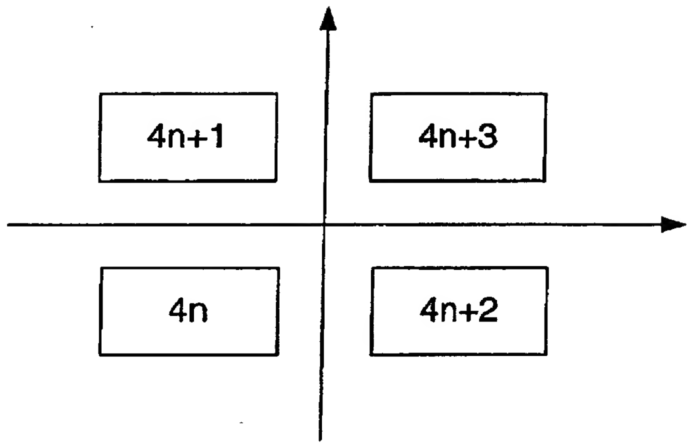

FIG. 6

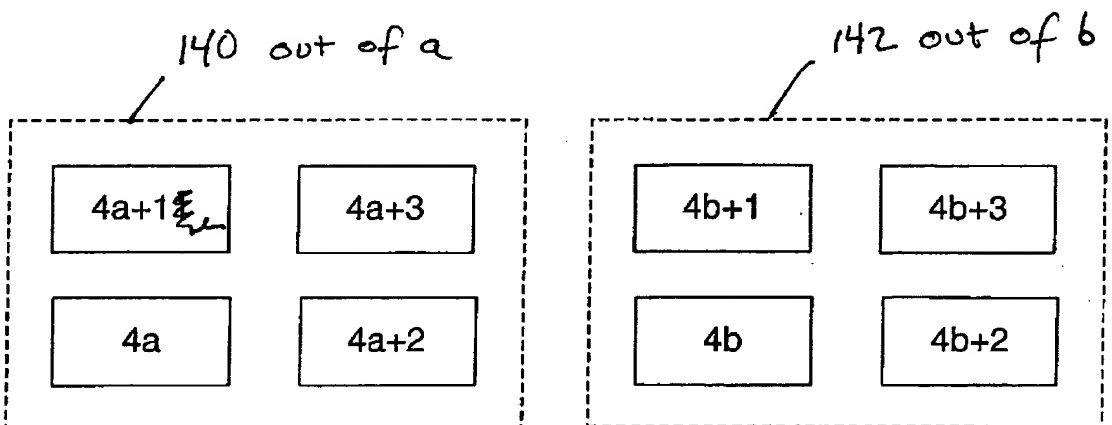

FIG. 7

Show Revisions